

Changes in Astigmatism Before and After Pterygium Surgery at Undaan Eye Hospital, Surabaya

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ABSTRACT

Pterygium is a common external ocular disease with a prevalence ranging between 0.7% and 33% globally. The disease is described as a wing-shaped, fibrovascular lesion that traverses the nasal or temporal limbs. This study aims to determine changes in astigmatism before and after pterygium surgery at the Undaan Eye Hospital in Surabaya. The population in this study were all pterygium sufferers who had changes in astigmatism before and after surgery at the Undaan Eye Hospital Polyclinic, Surabaya. The sample of 47 people was selected using probability sampling with the type "simple random sampling" or random sample. The instrument in this study used an observational sheet. The results of the study using the Mann-Whitney statistical test showed that the mean value before pterygium surgery was 3.89 and after pterygium surgery 1.38. Through the Mann-Whitney test, it shows that there are changes in astigmatism before and after the pterygium surgery is carried out. Based on the significance value (p value), the value obtained is $0.000 < \alpha$ (0.05), meaning that H_a is accepted or there is a change in astigmatism before and after pterygium surgery. The implication of this study is that pterygium surgery affects astigmatism changes.

Keywords: Astigmatic, Pterygium, Eyes

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INTRODUCTION

Pterygium is something expansion fibrovascular from conjunctiva that grows and leads cornea. Shaped like flesh, colored yellow until white. On circumstances This sufferer will feel not enough comfortable and if expansion from the pinguecula Already reach part from cornea eyes, then the sufferer will experience decline in function sight. Pterygium usually happens to some people frequently exposed with ray sun and wind, so there are lots of pterygium occurs in temperate areas _ tropical for example such as in Indonesia (Vaughan D. 2015).

At stage early pterygium usually No give symptom or give symptom light like eye felt hot, often red, felt block like There is object foreign, and on a more advanced level carry on can happen decline sharp vision consequence astigmatism even blindness Because axis vision cornea closed with network fibrovascular (Anbesse DH, et al 2017, Agrasidi PA,

Triningrat AAMP 2015, Erry , et al 2011). Abnormalities refraction known in forms of myopia, hypermetropia and astigmatism . Astigmatism is abnormality refraction (ametropia) that occurs when parallel rays of incoming light No focused on one retinal point but at a different point than usual happen consequence irregularities in curves cornea (Ilyas, 2012, Kaimbo , 2012). 13 The distribution of pterygium is worldwide , however more many in the area climate hot and dry which is characteristics from surrounding area _ equator (Saerang , 2013).

The prevalence of pterygium around the world ranges between 0.3-36%, and in 2000 it was reported more than 200 million people worldwide are diagnosed with pterygium (Anbesse DH, et al. 2017, Pan Z, et al. 2019). Pterygium is a disease that is often found, especially in tropical countries like Indonesia. Based on the results of the 2013 riskesdas data, it shows that the national prevalence of pterygium was 8.3 percent with the highest prevalence found in Bali (25.2%), followed by Maluku (18.0%) and West Nusa Tenggara (17.0%). DKI Jakarta Province has the lowest prevalence of pterygium, namely 3.7 percent, followed by Banten at 3.9 percent. The prevalence of pterygium in East Java is 2.7 percent. According to WHO, in 2011 the incidence of astigmatism was around 13 percent of refractive errors in the human eye. The prevalence of astigmatism ranges from 20 percent to 29.3 percent among adults in EUROPE, while it is 36.2 percent among subjects aged 20 years or more in the United States (Lopes et al., 2013).

Research conducted on 3280 adults of Malay descent living in Singapore, the prevalence of astigmatism reached 39.4 percent (M. Rosmandkk, 2012). Meanwhile, data on pterygium surgery cases at the Undaan Eye Hospital Polyclinic in Surabaya in 2019 was 89 cases. Indications for pterygium surgery include visual impairment, obstruction of eye movement, chronic inflammation and cosmetic problems. There are not many studies that can be used as a reference to determine whether the pterygium causes significant astigmatism that requires surgery. This study aims to find out whether there is a change in astigmatism before and after pterygium surgery at the Undaan Eye Hospital, Surabaya.

METHOD

This research uses an analytical observational method with a comparative retrospective cohort type, which is a type of research that studies the relationship between risk factors and effects that have occurred in the past, by selecting study groups based on differences in risk factors whose variables are measured based on historical records (Sugiyono, 2018). The place and time of the research was at the Undaan Eye Hospital Polyclinic, Surabaya, Jalan Undaan Kulon 17 – 19, Genteng District, Surabaya, the time of the research was in March 2022 with data on visits from pterygium patients in 2019.

The population in this study were all patients who experienced changes in astigmatism before and after pterygium surgery with a total of 89 people and samples were taken from patients who experienced changes in astigmatism before and after pterygium surgery with a total of 47 people at the Undaan Eye Hospital in Surabaya, using 2 variables,

namely independent and dependent variables, the independent variable is before and after pterygium surgery and the dependent variable is astigmatism.

RESULTS AND DISCUSSION

This research was conducted at the Undaan Eye Hospital Polyclinic, Surabaya, from 07 March 2022 to 01 April 2022. Data collection was carried out using the observation method of medical record results in 2019 with a total of 47 respondents. In this research, two parts of data will be discussed, namely general data and special data

a. General data .

Table 5.1 Table of gender characteristics of astigmatism patients before and after pterygium surgery at Undaan Eye Hospital, Surabaya 07 March 2022 - 01 April 2022

Gender _	Frequency	Percentage
Boy _	21	44.7%
Woman	26	55.3%
Total	47	100%

Based on Table 5.1, it is known that the characteristics of the respondent data are based on gender, 21 (44.7%) men and 26 (55.3%) women.

Table 5.2 Table of age characteristics of patients with astigmatism before and after undergoing pterygium surgery at the Undaan Eye Hospital Surabaya 07 March 2022 - 01 April 2022

Age	Frequency	Percentage
40 – 50 years	6	12.8%
51 – 60 years	20	42.6%
61 – 70 years	13	27.7%
71 – 80 years old	6	12.8%
81 – 90 years old	2	4.3%
Total	47	100%

Based on Table 5.2, it is known that the characteristics of the respondent data based on age group, the majority are aged 51-60 years, namely 20 (42.6%).

b. Custom data

Table 5.3 Table of descriptions of astigmatism patients before the procedure pterygium surgery at Undaan Eye Hospital, Surabaya 07 March 2022 -

Grouping astigmatism before operation	Frequency	Percentage
Light (0.5 – 1.0 D)	0	0%
Medium (1.0 – 2.5 D)	0	0%
Heavy (>2.5 D)	5	10.6%
Very heavy	42	89.4%
Total	47	100%

Based on table 5.3, it is known that astigmatism patients before pterygium surgery were included in the very severe category with the number of respondents being 42 (89.4%).

Table 5.4 Description of astigmatism patients after pterygium surgery at Undaan Eye Hospital, Surabaya 07 March 2022 - 01 April 2022

Grouping astigmatism after operation	Frequency	Percentage
Light (0.5 – 1.0 D)	38	80.9%
Medium (1.0 – 2.5 D)	4	8.5%
Heavy (>2.5 D)	1	2.1%
Very heavy	4	8.5%
Total	47	100%

Based on table 5.4, it can be illustrated that patients with astigmatism after pterygium surgery are included in the mild category 38 (80.9%).

Table 5.5 Normality Test Results

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Astigmatism After Operation	,474	47	,000	,476	47	,000

a. Lilliefors Significance Correction

Therefore _ amount sample as many as 47, then the normality test is appropriate is using Shapiro-Wilk, where it is written $0.476 > 0.005$; meaning the data normally distributed and can be done with the next test .

Because the data is normally distributed, a parametric test will be carried out for the 2 paired samples using the dependent t-test.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Astigmatism Before	3.89	47	,312	,045
	Operation				
	Astigmatism After Operation	1.38	47	,898	,131

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Astigmatism Before Surgery & Astigmatism After operation	47	,149	,318

Paired Samples Test

	Paired Differences				t	df	Sig. (2tailed)	
	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
	n	n	Mean	Lower				Upper
Pair 1 Astigmatism Before Operation - Astigmatism After operation	2,511	,906	,132	2,245	2,777	19.001	46	,000

Based on the significance value (p-value), the value obtained is $0.000 < \alpha (0.05)$, meaning that H_a is accepted or there is a change in astigmatism before and after pterygium surgery.

CONCLUSION

Based on the results of research regarding changes in astigmatism before and after pterygium surgery at the Undaan Eye Hospital in Surabaya, the following conclusions and suggestions can be drawn:

1. Astigmatism in pterygium patients before surgery was in the Very Severe category for 42 (89.4%) of the 47 respondents.
2. Astigmatism in pterygium patients after surgery was in the mild category for 38 (80.9%) of the 47 respondents.
3. There are changes in astigmatism in pterygium patients before and after pterygium surgery.

REFERENCES

- Anbesse DH, KassaT, KefyalewB, TasewaA, AtnieA, Desta B. 2017 . Prevalence and associated factors of pterygium among adults living in Gondar city, Northwest Ethiopia. *PLOS ONE*; 12(3):1-9.
- Agrasidi PA, Triningrat AAMP. 2018, Characteristics of pterygium sufferers in Tianyar Karang Asem village in 2015. *E- Journal Medika*. 2018;7(7):1-6.
- Blomquist, PH 2015. *Practical Ophthalmology: A Manual For Beginning Resident* (D. Jean Ray (Ed.); Seventh. American Academy Of Ophthalmology.
- Hanifah ESN, Ibrahim, Saleh MI. 2018. Correlation of sun exposure with the degree of pterygium in a special eye hospital in South Sumatra province for the 2015-2016 period. *Sriwijaya Medical Magazine*. 2018;1:20-5.
- DATIN Info. 2014. *Situation of Visual Impairment and Blindness. Data Center And Information from the Indonesian Ministry of Health. Indonesia.*
- I Ilyas S, Yulianti SR. 2012. *Ophthalmology. Edition 4. Faculty University of Indonesia Medicine. Jakarta.*
- Lyas S, Yulianti SR. 2014. *Ophthalmology 5th Edition. Jakarta: Hall Publisher .*
- Jiao, W, Chengchao , Z, Ting, W, Shaoyuan , Y, Hongsheng , B, Liping, L, Yan, L & Lihua, W. Prevalence and risk factors for pterygium in rural older adults in Shandong Province of China: A Cross-Sectional Study, *Hindawi Publishing Corporation BioMed Research International* 2014: 1.
- Josefien S. Vascular endothelial growth factor tears as factor risk grow repeat pterygium. *Journal of the Indonesian Medical Association*. 2013;7(4):139-43
- John D Sheppard, Arnulfo Mansur, Timothy L Comstock, John A Hovanessian. 2014. An update on the surgical management of pterygium and the role of loteprednol etabonate ointment. *Dovepress Journal: Clinical Ophthalmology*.
- Kaimbo DK. 2012. Astigmatism – Definition, Etiology, Classification, Diagnosis and NonSurgical Treatment, Chapter 4. In: Goggin M, editor. *Astigmatism - Optics, Physiology and Management. Croatia : InTech Europe.*
- Kenneth C. Chern, Michael A. Sidel. 2012. *Ophthalmology Review Manual. 2nd Edition. Lippincott Williams & Wilkins.*
- Liang QF, Xu L, Jin XY, You QS, Yang XH, Cui TT. 2012 . Epidemiology of Pterygium in Aged Rural Population of Beijing, China. *Chinese Medical Journal.*; 14(4):2-5.
- Notoatmodjo . 2012. *Health Research Methods . Jakarta : Rineka Cipta*

- Olujic SM. 2012. Etiology and Clinical Presentation of Astigmatism, Chapter 10. In: Goggin M, editor. Astigmatism - Optics, Physiology and Management. Croatia : InTech Europe ; Pg . 167-98
- PanZ, CuiJ , ShanG, ChouY, PanL, Sun Z, et al. 2019. Prevalence and risk factors for pterygium: A cross-sectional study in Han and Manchu ethnic populations in Hebei, China. *BMJ Open* ; 9(2):1- 12.
- Saerang , 2013, Vascular Endothelial Growth Factor Tears as a Factor Risk of Pterygium Regrowth. *J Indon Med Assoc* Volume : 63.
- Dahlan, M. Sopiudin. (2014) *Statistics for Medicine and Health*. Jakarta: Indonesian Epidemiology
- Sugiyono. (2018). *Combination Research Methods (Mixed Methods)*. Bandung: Alfabeta CV.
- Tano T, Ono K, Hiratsuka Y, Otani K, Sekiguchi M, Konno S, et al. Prevalence of pterygium in a population in Northern Japan: the locomotive syndrome and health outcomes in the Aizu cohort study. *Acta Ophthalmol* . 2013; 91(3):e 232-6.
- Vaughan D, Asbury T, Riordan-Eva P. 2015. *General Ophthalmology*. Edition 17. Jakarta: ECG Medical Book Publisher.